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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: **PEPTIDES AND PEPTIDOMIMETICS BINDING TO CD23**

(57) Abstract: The present invention describes compounds comprising new and useful peptides and peptidomimetics that can bind to CD23. They are capable of reducing inflammatory responses associated with auto-immune diseases, chronic inflammatory diseases, allergies and other inflammatory conditions such as those mediated by the mammalian immune system. Compounds of the present invention relate to a CD23-binding peptide wherein said peptide comprises an amino-acid sequence of X<sub>1</sub>-X<sub>2</sub>-X<sub>3</sub>-X<sub>4</sub>-X<sub>5</sub>-X<sub>6</sub>-X<sub>7</sub>-X<sub>8</sub>, wherein: X<sub>1</sub> is Phe, or is absent; X<sub>2</sub> is His or Ala; X<sub>3</sub> is Glu, Ser, Ala, Asn, Lys, or Cys; X<sub>4</sub> is Asn, Phe, Gln, Pro, Ser, or Ala; X<sub>5</sub> is Trp; X<sub>6</sub> is Pro, Arg, Glu, Gly, Cys, or Lys; X<sub>7</sub> is Ser, Pro, Leu, Thr, Ala, Gly, Asn, or absent; and X<sub>8</sub> is Phe, Gly, or is absent.

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## INTERNATIONAL SEARCH REPORT

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PCT/IB2005/001133

| A. CLASSIFICATION OF SUBJECT MATTER<br>G01N33/532 C07K7/06 A61K38/08 C07K14/705  |  |  |
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| According to International Patent Classification (IPC) or to both national classification and IPC  |  |  |
| B. FIELDS SEARCHED   |  |  |
| Minimum documentation searched, (classification system followed by classification symbols)<br>G01N C07K A61K   |  |  |
| Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  |  |  |
| Electronic data base consulted during the international search (name of data base and, where practical, search terms used)<br>EPO-Internal, PAJ, BIOSIS  |  |  |
| C. DOCUMENTS CONSIDERED TO BE RELEVANT   |  |  |
| Category *   | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No.  |
| X  | JP 2002 187899 A (CANON INC)<br>5 July 2002 (2002-07-05)<br>the whole document   | 1-5,<br>10-14,21   |
| X  | JOVAULT T ET AL: "PEPTIDES THAT MIMIC<br>CANDIDA ALBICANS-DERIVED BETA-1,2-LINKED<br>MANNOSIDES"<br>GLYCOBIOLOGY, IRL PRESS,, GB,<br>vol. 11, no. 8, August 2001 (2001-08),<br>pages 693-701, XP009026488<br>ISSN: 0959-6658<br>the whole document | 1-5,<br>10-14,21   |
| X  | WO 03/064457 A (ANTISENSE PHARMA GMBH;<br>BOSSERHOFF, ANJA-KATRIN; BUETTNER,<br>REINHARD; SZ) 7 August 2003 (2003-08-07)<br>the whole document   | 21   |
| -/--   |  |  |
| <input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in annex.  |  |  |
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| Date of the actual completion of the international search<br>11 August 2005  |  | Date of mailing of the international search report<br>23. 12. 2005 |
| Name and mailing address of the ISA<br>European Patent Office, P.B. 5818 Patentlaan 2<br>NL - 2280 HV Rijswijk<br>Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,<br>Fax: (+31-70) 340-3016   |  | Authorized Officer<br>Vogt, T                                      |

# INTERNATIONAL SEARCH REPORT

International Application No

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| X  | JOUAULT T ET AL: "PEPTIDES THAT MIMIC<br>CANDIDA ALBICANS-DERIVED BETA-1,2-LINKED<br>MANNOSIDES"<br>GLYCOBIOLOGY, IRL PRESS,, GB,<br>vol. 11, no. 8, August 2001 (2001-08),<br>pages 693-701, XP009026488<br>ISSN: 0959-6658<br>the whole document | 1-5,<br>10-14, 21   |
| X  | WO 03/064457 A (ANTISENSE PHARMA GMBH;<br>BOSSERHOFF, ANJA-KATRIN; BUETTNER,<br>REINHARD; SZ) 7 August 2003 (2003-08-07)<br>the whole document   | 21  |
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| <input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in annex.  |  |   |
| * Special categories of cited documents :<br><div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&amp;" document member of the same patent family</p> </div> </div> |  |   |
| Date of the actual completion of the international search<br><div style="text-align: center;">11 August 2005</div>   |  | Date of mailing of the international search report<br><div style="text-align: center;">23. 12. 2005</div> |
| Name and mailing address of the ISA<br>European Patent Office, P.B. 5818 Patentlaan 2<br>NL - 2280 HV Rijswijk<br>Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,<br>Fax: (+31-70) 340-3016   |  | Authorized officer<br><div style="text-align: center;">Vogt, T</div>                                      |

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International Application No

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| C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT |  |                       |
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| Category *   | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No. |
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| X  | SANTAMARIA H ET AL: "Identification of<br>peptide sequences specific for serum<br>antibodies from human<br>papillomavirus-infected patients using<br>phage display libraries"<br>CLINICAL IMMUNOLOGY (ORLANDO),<br>vol. 101, no. 3, December 2001 (2001-12),<br>pages 296-302, XP009045311<br>ISSN: 1521-6616<br>the whole document<br>----- | 1-5,<br>10-14,21      |
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| X  | WO 2004/026326 A (STICHTING KATHOLIEKE<br>UNIVERSITEIT; FIGDOR, CARL, GUSTAV;<br>TORENSMA, RUU) 1 April 2004 (2004-04-01)<br>the whole document<br>-----   | 1-5,<br>10-14,21      |
| T  | MIURA Y ET AL: "Peptides binding to a Gb3<br>mimic selected from a phage library"<br>BBA - GENERAL SUBJECTS, ELSEVIER SCIENCE<br>PUBLISHERS, NL,<br>vol. 1673, no. 3,<br>4 August 2004 (2004-08-04), pages 131-138,<br>XP004523265<br>ISSN: 0304-4165<br>the whole document<br>-----   | 1-5,<br>10-14,21      |
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| X  | DATABASE EMBL [Online]<br>1 October 2003 (2003-10-01),<br>GLOECKNER ET AL.:<br>XP002321307<br>retrieved from EBI<br>Database accession no. Q7USF5<br>the whole document<br>-----   | 1,2                   |

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# INTERNATIONAL SEARCH REPORT

International Application No

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No. |
|------------|--|-----------------------|
| X          | <p>DATABASE EMBL [Online]<br/> 1 March 2004 (2004-03-01),<br/> GALAGAN ET AL.:<br/> XP002321308<br/> retrieved from EBI<br/> Database accession no. Q7RYN4<br/> the whole document</p>   | 1-3                   |
| X          | <p>DATABASE EPO PROTEINS [Online]<br/> 14 June 2002 (2002-06-14),<br/> CHAUDHARY ET AL.:<br/> XP002321309<br/> retrieved from EBI<br/> Database accession no. AX411500<br/> SEQ ID NO: 6 of W00228886<br/> the whole document</p>                              | 1                     |
| X          | <p>DATABASE GENESEQ [Online]<br/> 12 February 2004 (2004-02-12),<br/> CHACONAS ET AL.:<br/> XP002321310<br/> retrieved from EBI<br/> Database accession no. ADF72653<br/> SEQ ID NO: 19 of US2003/0170693<br/> abstract</p>                                    | 1,10,11,<br>13,14,21  |
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| P,X        | <p>WO 2005/019258 A (GENENTECH, INC; ABBAS,<br/> ALEXANDER; CLARK, HILARY; OUYANG, WENJUN;<br/> WILLI) 3 March 2005 (2005-03-03)<br/> the whole document</p>   | 1-57                  |
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International application No.  
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## Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 18-20  
because they relate to subject matter not required to be searched by this Authority, namely:  
Although claims 18-20 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:  
1-3, 7-34, 51, 53-57 (all partly)

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

Invention 1: claims 1-3, 7-34, 51, 53-57 (all partly)

Subject matter directed to compounds/ polypeptides/ peptidomimetics comprising the polypeptide with SEQ ID NO: 1.

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Invention 2: claims 1-3, 7-34, 51, 53-57 (all partly).

Subject matter directed to compounds/ polypeptides/ peptidomimetics comprising the polypeptide with SEQ ID NO: 1.

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Invention 3-10: claims 1-34, 51, 53-57 (all partly)

Subject matter directed to compounds/ polypeptides/ peptidomimetics comprising the polypeptide with SEQ ID NO's: 3-10.

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Invention 11: claims 1, 2, 4, 7-34, 51, 53-57 (all partly)

Subject matter directed to compounds/ polypeptides/ peptidomimetics comprising the polypeptide of claim 1, which is not covered by any of the inventions 1-10.

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Inventions 12-21: claims 35-50, and 51 (partly)

Subject matter related to peptidomimetics of polypeptides with SEQ ID NOs: 1-10.

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Invention 22: Claims 51, 53-57 (partly) and 52

Subject matter directed to the dipeptide Ac- w-n-CO<sub>2</sub>H

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Inventions 23-33: Claims 51, 53-57 (all partly)

Subject matter directed to compounds listed in Tables 1 and 2 not falling within the scope of any of inventions 1-22. Such as compounds: 222, 300, 329, 330, 359, 410, 411, 436, 489, 490 and 492.

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/IB2005/001133

| Patent document<br>cited in search report |    | Publication<br>date | Patent family<br>member(s)  | Publication<br>date  |
|---|----|---------------------|---|--|
| JP 2002187899                             | A  | 05-07-2002          | NONE  |  |
| WO 03064457                               | A  | 07-08-2003          | EP 1472279 A1<br>JP 2005528338 T  | 03-11-2004<br>22-09-2005   |
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